



NITE-TIMES NEWS

Chicago Area Timex Users Group
Volume 4, Number 6

Downers Grove, Illinois
November/December 1990

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C.A.T.U.G. CLUB OFFICERS

Here is the list of 1990 club officers and how to contact them. The club has two strong SIGS, SPECTRUM/TS2068 and QL. If you have questions about either of these fine machines or even the ZX81/TS1000/TS1500 call one of the officers. C=312, S=708.

POSITION	NAME	PHONE	PRIMARY FUNCTION
President	Butch Weinberg	C373-2470	The buck stops here...
Vice-President	Bob Swoger	S576-8068	Newsletter, BBS, etc.
Secretary	John Donaldson	S232-6147	Records and Reporting
Treasurer	Al Feng	S971-0495	Dues and Purchasing

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Volume IV, Number 6

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November/December 1990

NITE-TIMES Information

The Nite-Times News is the newsletter of the Chicago Area Timex Users Group. For an annual fee of \$12.00 you can become a CATUG member with full membership privileges. Send your dues to :

CATUG TREASURER AL FENG
15 WAKE ROBIN CT
WOODRIDGE IL 60517

The Chicago Area Timex Users Group is pleased to exchange newsletters with other Timex and Sinclair supporting users groups at no charge. Send all newsletter requests to:

CATUG EDITOR BOB SWOGER
613 PARKSIDE CIRCLE
STREAMWOOD IL 60107-1647

If you desire to reprint any articles that appear here, please provide credit to the author and this newsletter.

We encourage your user group to copy this newsletter and distribute it at your regular meetings to your members free of any charge as we believe that this will encourage better meeting attendance. If you are a user group that feels as we do, please let us know in your newsletter so that we might do this for our members and keep our attendance up.

Articles originating from our group may be downloaded from our BBS and reprinted.

CONTRIBUTORS TO THIS ISSUE

Jim Brezina
Al Feng
John Donaldson
Bob Swoger, K9WVY

CLUB MEETINGS

!!!!!! MEMBERS TAKE NOTE !!!!!!
The Chicago Area Timex Users Group NOW meets on the THIRD Saturday of each month at the home of our meeting coordinator Steve Cooper in Downers Grove, Illinois from 1:00 to 5:00 PM. Steve's home is lovingly called

the CLUB HOUSE and is located at 1300 Maple Street in Downers Grove just 2 blocks southwest of the Downers Grove Public Library. Steve should be contacted evenings at 708/968-3553. to confirm the meeting schedule.

When visiting be careful of the Dutch Doooooooooooooooooooo.....

INPUT/OUTPUT

An Open Letter to Rod Gowen
by
Bob Swoger

Rod, first let me say WE ALL love you, really need you and don't want you to go away, but in your BITS & BYTES section of THE PLOTTER V8 #12, you seemed to indicate that a newsletter is ONLY to be WHAT happened at the last meeting or affair AND WHEN and WHERE the next meeting is to be held. Well I and others feel that although the newsletter must be at least that, it must be MORE in the Timex/Sinclair community. If it were only that, there would be little need to circulate the newsletter outside your local paid group. Even your out-of-towners would not have much need of that kind of newsletter.

We, the present CATUG membership, have only seen THE PLOTTER since the July/August issue of 1989, but it has been one of the TOP newsletters around with good articles and NEAT programs to use and learn from. I for one am glad that your editor puts out a newsletter of the quality that THE PLOTTER has. Yes, more than what you indicate as the definition of a newsletter, a newsletter for T/S users must INFORM and EDIFY the community.

Do you remember, Rod, who Clive designed his computer for? Derek Ashton, author of the 747 Flight Simulator, reminded me! He started out in life as a U.K. citizen. Clive developed ZX computers for a community of folks who had no computers at

home, just 'empty coal buckets'. The users still around today bare this out. In our own club of 22 people we have at least 6 that are retired, one in such bad financial condition we won't take dues from him, most of the rest in an age situation such that their employers are already preparing them for retirement, that is, TEACHING THEM TO LIVE ON A FIXED INCOME!

When someone in the group does build up a little money, they buy MS-DOS machines and we never hear from them again! Those of us that remain hard core T/S users will keep saving and once in a while have some spare money to purchase items from our venders.

CATUG is committed to OUR venders and UPDATE!, our last Magazine and want to help them 'STAY ALIVE'. By the way, Rod, you rank high with our members because .of, among other reasons, your quick turn-around time of our purchases, great work!

Rod, you said that you were the Editor of THE PLOTTER for 4 years but I am sad to say that most of us have never seen any of those issues as our library collection of the PLOTTER only goes back to mid-89. But I'll bet that it is now built on a foundation that you started and that Dick Wagner makes it as good as it is after a tradition you no doubt were a part of.

Because you have a new generation of T/S users out here is why I have asked editors to reprint older articles, we have never seen those older articles and are lost out here without them! We see in print passing references to software already out in the world but have no idea what it is or what it is supposed to give us if we own it so we hold back buying it.

I felt that the software I developed and the 747 FLIGHT SIMULATOR my friend Derek Ashton wrote back in 1984, that

you said RMG couldn't sell, would never see the light of day in the U.S. T/S community if I didn't 'take the bull by the horns'. So I published the 747 FLIGHT SIMULATOR manual in NTN V4 #3 and LogiCall in NTN V3 #6 and offered it to the public at the SMUGfest at a give away price of \$5. Why? Because Derek's work would go unnoticed if I didn't publish his manual, people want to see SOMETHING of what they are buying first.

As for LogiCall, I had been hearing complaints about Larry's system and LogiCall would have solved them all but I couldn't get to the LarKen users to help them! I offered LogiCall to Larry Kenny to give away free with his LK-DOS system and he didn't take it. I tried to get it published by the only magazine I knew of at the time, TIME DESIGNS, and they wouldn't publish it.

I was in the same predicament in the days of ZX80 and ZX81. I kept reading about all the crashes due to the RAM PACK connector and I had the answer. None of my friends had crash problems and they snickered at the rest that did and even bought machines from those that did for junk prices, went home and put Nu-Jol on the connectors and had no-crash back-ups for their systems. The group I was in back in the early 1980's was the MOTOROLA group and we had been using Nu-Jol since our QUASAR and MICOR days to cause our connector systems to have integrity in our top-of-the-line products. But I could get no one to publish this information!

Now that I am at the helm of this newsletter, I will see to it that THE WORD GETS OUT, I will publish for those that have been held silent for so long. That is why our newsletter is so long just now, we still have unpublished material, material turned down by other publishers and venders!

Here is an input you should pass along to Dick Wagner. Dick has been running articles by Michael J. Di Rienzo. In July of 1990, we didn't get a June issue, Michael added a note to his articles which no longer permit us to copy and hand out as take-homes THE PLOTTER newsletters. The result is that our membership has been cut off from seeing THE PLOTTER since May 1990, too bad. They do miss it. Furthermore, I can't contact Michael for feedback on his articles as we have no phone number for him. Maybe Dick can fix those problems.

As for your comment about the frequency of the publication, Rod, you know that putting out 80 copies of a newsletter that YOU ALONE put together is quite a task and you do it sometimes because NO ONE ELSE will! In my case, I have to put out the newsletters of 4 different clubs. If I had to do this every month for every club my wife and family would really suffer! I did try but it was murder. There is more to life than just computers, I can still remember!

So, CATUG will continue to call this a club newsletter as we are supported by only the club dues and not by the ads of venders. This is why you will see RMG, EMSOFT and soon other venders ads in our newsletter at no cost to those venders as we are offering a service to the T/S community, both users and venders, not a magazine to make money from the community.

With respect I remain sincerely yours, Bob Swoger, Editor
Chicago Area Timex Users Group

TREASURY NOTES

Our balance stands at \$291.33.
Our current paid membership stands at 25.

Al Feng, Treasurer
Chicago Area Timex Users Group

SECRETARY'S NOTEPAD

November 17, 1990

Meeting was called to order at 1:56PM. Those in attendance were Messrs. Brezina, Cooper, Donaldson, Mills, Pashtoon, Sauter and Swoger.

Everyone present was reminded that our monthly meetings are set at the third Saturday of each month. If there is any question about this or about weather conditions, etc., call Steve Cooper.

Word came from Frank Davis that Indiana will not be the staging ground for a 1991 Computerfest despite earlier rumors. Some pressure was put on CATUG at the SMUGfest to host it. While we're grateful for offers to help with mailing, etc., from our Indiana friends, too many of our key members have made many commitments outside of Sinclair/Timex circles to permit it. Sorry, folks.

Joan Kealy, our Texas member, was suffering from a fast-slow problem with her TS2068/LarKen system. She had a LarKen fast EPROM tied to a slow Western Digital WD1770 controller chip. Bob Swoger to the rescue: He explained that with a fast EPROM, you must have a fast disk drive; with a slow EPROM and slow controller chip you can use fast or slow disk drives.

Get this! One of the reasons our PDP computer (the one that produces this newsletter) failed between June and November was that the phone lines were "scrubbed" by the local phone company. Apparently, the phone company checks its lines with regularity, looking for those which aren't used. If there are no outgoing calls made on a line within a period of time, they assume that the line is not being used and the line is disconnected, allowing the wire to be used for another subscriber. Since our computer

never calls out, the lines were cut. Needless to say, they've been reinstalled and the BBS is working again - on the old familiar numbers. Who says you can't fight the system?

For those who have a Zebra disk drive: It will work with a Tasman "C" interface but it won't work with a "B" interface. (Which means that CP/M won't work with the "B" interface, either.)

Bob Swoger was asked by Steve Cooper if they could join forces in making a list of all the software our group members own for the TS2068. Swoger indicates that the list will be a long one; he personally has over 200 programs. And Cooper has disks with about 100 simple programs each! Another list should be made for QL programs.

John Donaldson reported that he has been promised copies of some of the back issues of Time Designs Magazine from another source. Unfortunately, neither the source nor he has a complete set. (However, the source got 3 more issues after his stopped coming!) Does anyone have all the issues?

Meeting was closed at 2:34PM.

December 15, 1990

Meeting opened at 3:45PM due to the Secretary's tardiness. Those present were Messrs. Brezina, Cooper, Donaldson, Feng, Mills, Pashtoon, Sauter and Swoger.

Bob Swoger was apprized of another fast-slow TS2068/LarKen combination in Miami. (See Joan Kealy item in last month's minutes). These had been shipped from RMG. A call to Rod Gowen was made. Rod was told by Larry Kenny that it didn't make any difference.

There was discussion about an author in another newsletter who forbids any copying of his items. He writes good information but if it's confined to

one newsletter, The Plotter, he limits his audience and it appears that he is unwilling to share it with outsiders. This will only diminish the spirit of the Sinclair/Timex community. We're small enough already. Does he want us to be smaller? How about lifting the restrictions?

ZX-APPEAL announced that it will cease to function due to a number of causes, one being lack of input. A request comes from our group that instead of folding, someone other than the present editor could pick it up and rerun articles prior to about 1988 for the generation who arrived in Sinclairland a little later than some of us oldtimers.

A longstanding problem with JLO-LarKen disk incompatibility has been cleared up. (Disks had been blown away when in a foreign environment!) It seems that the Oliger system had defective chips which could wipe track 0 off LarKen disks. We hear that if a board was bought from JLO, Oliger is replacing the offending chips - but only if bought from him.

The Club's Amdek color monitor was put in the pink (and blue and green) of condition and is vastly superior to the old TS2068/old, tired color TV hookup. Thanks, Bob and Nazir.

RMG's new catalogs were distributed at the meeting. Thanks, Rod! We'll get them into the newsletter.

An election of officers was held by secret ballot. The results were:

President - Nazir Pashtoon
Vice-President - Steve Cooper
Secretary - John Donaldson
Treasurer - Al Feng

Congratulations to each of these fearless and selfless people!

John Donaldson, Secretary
Chicago Area Timex Users Group

GATOR'S TWISTED PAIR

!!! REMEMBER !!!
We STILL have a 24 hour BBS and encourage you to exchange mail and contribute to the Download Section. Use it and have fun!

```
*****
*      C A T U G B B S      *
*      708/576-7140        *
*      Type at the > prompt: *
*      MOTOROLA then GUEST  *
*      BYE to log out       *
*      Commands are: DIR, TYPE, *
*      UPLOAD filename.type *
*      DOWNLOAD filename.type *
*****
```

Bob Swoger, SYSOP
Chicago Area Timex Users Group

NEWS ITEMS

As of our October meeting we are meeting again on the THIRD Saturday as we did before mid-1989.

ITEMS FOR SALE THROUGH THE CLUB

LogiCall AOS-LKDOS Software Ensemble for TS2068 and Spectrum includes LogiCall 4.4 TASWORD II V2.4 VU-CALC VU-FILE and MTERM2 Drivers modified for LogiCall, DISKS.B1 TAPES.B1 steprt.B1 HEADER.BT (tape header reader by Nazir Pashtoon) FORMAT.B MOVE.BL and more all on 2 SSDD disks for \$5. You must specify your LK-DOS EPROM version. If you already have a copy you are encouraged to distribute copies to other LarKen LK-DOS users for as you see by the price we are not in the business of making money on it, just making LarKen's LK-DOS the BEST!

So you like to fly? The 747 Flight Simulator for Spectrum by Derek Ashton of DACC sold over 40K copies in EUROPE. Requires Spectrum Emulator. Supplied on LarKen SSDD or DSQD disk only at this time for \$10 which goes to Derek Ashton now

working at MOTOROLA, INC.,
Schaumburg, IL.

Call in requests to Bob Swoger
at W708-576-8068 H708-837-7957

Want to try MS-DOS first before you switch? Try QLuMSi DOS, the MS-DOS SIMULATOR on your QL first.

QLuMSi (disk/specify)\$15

Try Al's Side-Kick on your QL. It is an AOS like LogiCall on the TS2068 and can make your life on the QL a lot easier [you may never lust for MS-DOS again!]

QLUSTer (disk/specify)\$10

CALL: Al Feng H(708) 971-0495

SPECIAL DEALS AND BUYS

It has come to our attention that some LarKen Users are using something less than Version 3 firmware. The club will supply updated EPROMS, SYSTEM DISKS, and MANUALS for just \$5 which includes shipping and handling, free if ordered with LogiCall or Spectrum ROM.

If you are a LarKen LK-DOS owner and would like a SPECTRUM V2 kit for your system we will supply an EPROM, socket and 74HCT32 for \$12 which includes shipping and handling. The install instructions are in your LarKen manual. We shall not be responsible for your install job. AERCO owners need only the SPECTRUM EPROM for \$10

If you have a mismatch between you LarKen DOS EPROM and your Western Digital Controller chip, we will send you the correct one for free on behalf of our friends Rod Gowen of RMG and Larry Kenny of LarKen.

Call in requests to Bob Swoger
at W708-576-8068 H708-837-7957

ARTICLES

ARCHIVE PRIMER

by
Al Feng

Each SINCLAIR QL comes bundled with four "business" programs. These vary in utility for the user based on individual background and current/future needs.

The four programs share the characteristic of being very compact [apparently, some of the programs were originally intended for CP/M computers, and this is reflected in the use of disk access in lieu of available RAM storage by QUILL and ARCHIVE; with, ABACUS being the notable exception].

The ease of use of the programs varies with the background of the user, but thankfully we can consider all of the programs as "second generation" software.

QUILL and ABACUS are probably easier to use than ARCHIVE for most users. In fact, if you are not a POWER USER, then you too may have found ARCHIVE to be daunting.

The "problem" with ARCHIVE is that the HELP files really don't "help" you with the program's syntax. Until you know, you don't know. And, you really can't "fake it" the way you can with the other three programs. ARCHIVE's syntax is very specific.

CREATE, END CREATE. Are we playing God with the Universe? If you've gotten far enough to see the blank, central window (i.e., the "void") with a red DOS-like prompt in a lower COMMAND WINDOW, you already know that you can't just begin typing in any of the "words" seen in the PROMPTS window at the top of the screen at the COMMAND LINE. You have to know exactly what-and-how you want to define ALL the FIELDS before you start to work, otherwise you're only going to have

trouble later on when the time comes to fill in your RECORDs. Perfection counts.

A greater problem is need. A computer is a task oriented solution for specific problems. We need not use a computer to do tasks better handled by other tools. If you do not have an overwhelming need for more than a couple of dozen records, then 3x5 file cards (or, ROLODEX-type system), or a sheet of paper, may remain a better solution.

If you're beginning to perceive a need for using a database program, you can:

- 1) Finally, dust-off and read the QL USER GUIDE;
- 2) Roll your eyes at the QL UG(h!) text, and buy more file cards;
- 3) Buy a copy of DBEASY; or,
- 4) Read the rest of this discourse.

Okay, you've read the QL USER GUIDE's section on ARCHIVE at least once, and you can make your way through the example. Somehow, you are still having trouble setting up a database. Is it the obliqueness of the USER GUIDE? Is it the program? Is it you?

"Roll(ing) your eyes" isn't the best option; but, buying a copy of DBEASY and/or reading the rest of this discourse should help you to varying degrees.

Bill Cable's DBEASY is a front-end and template for the ARCHIVE program which exploits the database's structured programming language.

DBEASY (version 1.3) presents you with a menu from which you can select how you want to handle your database. With the exception of initial data input, and the subsequent \$string query, my recollection is that ALL input is single key [often, cursor_key + <ENTER>].

The record screen has a specific number of fields allocated for text and numbers. This has obvious disadvantages; but, after you have gained familiarity with the ARCHIVE's programming language, you will find that these can be edited.

My limited, observation is that DBEASY may be a misnomer. Not because it is difficult to use, but because it may be of benefit to all ARCHIVE users (existing databases may be used after either "adjusting" the field names, or by customizing the program's front end).

While you're waiting for your copy of DBEASY to arrive in the mail (?!), you may want to experiment with this ALTERNATE METHOD for CREATing an ARCHIVE database.

First, forget everything you've heard about a database being like a set of file cards. You just cannot scribble-and-erase here, there, or anywhere. We may be better prepared if we think of a database's format as being akin to a governmental form (i.e., "Rigid").

Unlike a word processor where you can twiddle-and-tweak with ideas for paragraphs, all the FIELDS of a database must be pre-DEFINED before you begin putting in any of the RECORDs.

Power users too familiar with setting up their databases are probably saying: "Big deal!" But, a computer is supposed to make things easier. Why should one first need to consolidate (m)any randomly jotted notes onto a single sheet of paper prior to beginning to ensure that everything that must be included is? It would be better if any database could be constructed on-the-fly.

Now, consider your database as being a matrix. Uh oh! You may recall that calculus was a prerequisite for the course on matrices. Don't worry. We've all seen examples of matrices since we were in grade school. The "multiplication table" and

the "mileage between cities" chart(s) are common examples of matrices. In a meaningful matrix, the data in the middle of the grid can be correlated to the labels of the 'X' or 'Y' axis. For the database, the 'X axis' represents the FIELDS, and the 'Y axis' represents the RECORDs.

Because of the structure of the Psion programs, you can first set up your database in ABACUS by constructing a valid matrix and then IMPORTing it into ARCHIVE. For some of you, a light should have gone on in your head. For the rest, read on.

Just LOAD the ABACUS/QLSS spread sheet program into your QL and start typing in the label names for items you think you may want to track in your database. Use the following example as a model, beginning in CELL 'A1'.

	A	B	C
1	Star	RtAccnsn	magnitude
2	Achernar	1h 35m	1
3	Acrux	12h 22m	1
4	Agena		

All the CELLS are "text" with the exception of 'C2' & 'C3' which are "numerical" values.

While you can change the names in the columns after you've input all the FIELD label names, some foresight helps (corrections can be made by adding columns and inserting the forgotten, or misplaced, label in the correct column). The better organized you are, the quicker the entire process will be.

Depending on the RECORDs, you may wish to do the bulk of input from the matrix. This is especially applicable if you are still using microdrives for storage as this will circumvent repeated media access during initial data INPUT.

After setting up the matrix's framework, you may decide that you would rather sub-divide "declination" into two parts:

	A	B	C	D	
1	Star	RAh	RAM	magnitude	
2	Achernar	1h	35m		1
3	Acrux	12h	22m		1
4	Agena	13h	58m		1
5	Aldebaran	4h	31m		1
6	Altair	19h	47m		1
7	Antares	16h	25m		1
8	Arcturus	14h	12m		0
9	Betelgeuse	5h	51m		1
10	Canopus	6h	22m		-1
11	Capella	5h	11m		1
12	Deneb	20h	39m		1
13	Fomalhaut	22h	53m		1
14	Pollux	7h	30m		1
15	Procyon	7h	37m		0
16	Regulus	10h	4m		1
17	Rigel	5h	11m		0
18	Sirius	6h	42m		-1.6
19	Spica	13h	21m		1
20	Vega	18h	34m		0

This was done by using:

```
<F3>      (g)rid
           (i)nsert
           (c)olumn, at C
```

to insert a single 'column C' (indicate '2' for two columns). The labels, as well as data, in columns 'C' & 'D' are then amended to suit your current specifications.

All right. You've gotten this much done. Now what? Simply follow the standard EXPORT sequence:

```
<F3>      (F)iles
           (E)xport
           <ENTER> (for data)
           range (<ENTER> for
                  default)
           (c)olumns
           to ____ (e.g., 'STARdata').
```

Note: the default '_exp' extension is automatically added to the EXPORTed file by the ABACUS program.

So, now that you've created an IMPORT/EXPORT file you'll want to switch to ARCHIVE. But, before you QUIT ABACUS, SAVE the file as an '_aba' file. Go through the SAVE sequence and call the file 'STARdata(_aba)'.

Now, QUIT the ABACUS program and LOAD ARCHIVE. Then type:

```
Import "flp2_STARdata_exp"
to "STARdata"      <ENTER>
```

The QL will CREATE the file on your default medium. When the cursor returns, type:

```
display      <ENTER>
```

and [ta-DAH!], you should see your newly created database file (see below):

```
Logical name : main
Star$        : Achernar
RAh$         : 1h
RAm$         : 35m
magnitude    : 1
```

```
Now type:      next      <ENTER>
```

and, you should see the second record (i.e., "Acrux"). If you type:

```
last          <ENTER>
```

You should see the last record which you typed in (in this example: "Vega"). Now, if you type:

```
DIR "mdv2_"    <ENTER>
```

you will get a DIRectory of your data disk. You should see files named:

```
'STARdata_exp'
'STARdata_aba'
'STARdata_dbf'
```

If you ever need to add more FIELDS to your database (eg., "Declination", "comment1\$"), either go back to the original 'nnnn_aba', or EXPORT the current 'nnnn_dbf' to 'nnnn_imp' (where 'nnnn_ext' is the name of the appropriate file).

From here on, using ARCHIVE is pretty straight forward. To add new data, type "alter" to enter the correct mode for 'ALTERing' (amending) the RECORDs in the database.

Remember to CLOSE the RECORD file before turning off your QL (ARCHIVE automatically CLOSEs the current file when you QUIT the program).

[Now this is where Al begins to lose his ever loving mind! ED] So, the final question may be: Why should I bother changing to the ARCHIVE if I'm using one of the database programs available for the TS-2068? There may not be a reason to change. The 2068 is still a viable computer for many users; and, its software seems to satisfy those who use it. But, if you are in a situation which may dictate familiarity with other "second generation" software, then you may find that a QL (about \$100) with self-contained storage may be a good investment even if you are using a 2068 with a disk interface.

QL disk interfaces cost about \$120/\$170 (used/new) without memory. While this is not as inexpensive as a PC/CLONE i/f, I don't think that it is high when compared with the cost of a LARKEN or OLIGER interface. At some point in the future (if you don't wait too long) you can probably recoup this cost by selling your 2068's disk interface!

Finally, unless you're using single-sided disk drives, you can probably use the same disk drives on a QL as you are currently using for your 2068 (720K / DSQD is the de facto QL drive in either 3.5" or 5.25").

HAPPY TRAILS, AND COMPUTING,
TO YOU. . .

Fixing My FDD3000

by

James F. Brezina

A while back, something I feared would happen, did. My FDD 3000 stopped working. Since Zebra Systems quit supporting the TS computers and dropped the FDD3000, I didn't know where I could get it fixed. Dan Elliot has never mentioned the repair of disk systems, I didn't know if I could send it to him. However, since my work before retirement was the repair of electronic equipment, I thought I would try to fix it myself. The big drawback was

that I had no schematics on the unit. I had purchased the technical manual on the system, but, that was no help. All it contained was machine language and no schematics. Therefore, it was of no use to me in repairing the unit. I had to figure out how to disassemble the unit on my own. I was hoping that I did not have to remove the disk drives.

All owners of the FDD know that, immediately after turning it on and then inserting the disk, you hear the disk spinning and the indicator light flashes. Turning on the computer next causes the disk to spin again and the copyrights to appear on the monitor screen. My unit did neither. I presumed, from this, that the motor which spins the disk was not working for some reason.

I removed the cover of the unit and looked down at the power supply section. I could see 8 rectifier diodes and most of the rest of it was covered by a heat sink fastened to three voltage regulators. The power supply board was held down at the front by a moveable piece of gray plastic. The back end was under the transformer. I took my volt-ohm-milliammeter and checked the voltage on the diodes. They were all under 10 and 5 volts. Something was causing that voltage to be low and, I would have to remove the power supply assembly to work on it further.

The power supply assembly was mounted on a gray plastic frame which was mounted to the bottom of the cabinet with three screws. There is a wire from the transformer which is connected to the power fuse holder with a push on connector. You will have to pull this off the lug on the fuse holder or you will break the lug off the fuse holder. I didn't do this and had to replace the fuse holder. After removing the screws from the bottom of the cabinet, I found that I had to carefully move a

slot in the plastic frame over the power line grounding lug in order to free the power supply from the cabinet. There were three 3 wire cables coming off the power supply board. They ran under the drives and had enough slack to let me remove the assembly from the cabinet enough to work on it. Where the wires went into the board, they were marked +5 and +12. I don't recall any marking for the third wire which had to be ground.

The heat sink on the regulators had threaded holes for screwing the tabs on the regulators to it. I was glad the screws weren't mounted with nuts. The transformer was held in place by formed corners in the plastic frame and by a plastic cover that was held in place by screws through the plastic frame. When I removed the cover and picked the unit up by the transformer, the power supply board fell off the lugs on the transformer. The solder on the power supply board showed no impressions that would indicate a secure solder connection to the lugs on the transformer. This was the cause of my trouble. It was also, in my opinion a manufacturers defect, but, since the vendor has deserted us, and it was out of warranty, I had no recourse to the vendor for warranty repair.

I removed the old solder from those holes and resoldered the transformer to the power supply board. I then replaced the heat sink on the regulators and reconnected the wire to the fuse holder. I set the power supply assembly on its side and reconnected the FDD to my computer. I turned the FDD on and checked the voltages coming off the diodes. They were now the required 5 and 12 volts. I placed a disk in drive A and heard the spinning sound. I turned the computer on, heard the spinning sound, and got all the copyright notices on the screen. I then tried loading in a program from the disk and that worked. I had repaired my FDD!

ADS

To put an AD in the Computer related section of the BBS, put a file in your account with the filename.filetype: COMPUTER.ADS
!!! Our ADS are free !!!

FOR SALE: ON 910107

Color Computer DRIVE 0 1/2
HEIGHT DOUBLE SIDED W/CABLE &
HDS CONTROLLER W/RS-DOS ...\$150
SANYO BETA STEREO HI-FI RECORDR
W/REMOTE & MANY PRE-RECORDED
ORIGINAL TAPES & USED BLANK
TAPES\$375
PRICES NOT FIRM CALL Rich Polk
h708-830-0043 LEAVE MESSAGE

FOR SALE: ON 910107

MAC PLUS SYSTEM INCLUDES 2.5 M
RAM 30 MEG HARD DRIVE W/SCSI
CABLES (SEAGATE DRIVE, 40 MS)
800K EXTERNAL FLOPPY DRIVE ALL
WITH ORIGINAL MANUALS AND SHIP-
PING BOXES AND DISKS. SOFTWARE
INCLUDES SYSTEM 6.0.4,
FULLWRITE PROFESSIONAL
(EVALUATION CPY, FULL FUNCTION,
MANUALS, SHORT CUT CARD, DISKS,
AND UPGRADEABLE (WITH UPGRADE
NOTICE TO VERSION 1.5))
FULLPAINT W/COLORPRINT
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REGISTRATION TRANSFER FOR ALL
HARDWARE AND SOFTWARE MOUSEPAD
AC POWER SWITCH BOX W/SURGE AND
RFI/EMI PROTECTION EXTRAS
ASKING \$2000 CALL DENNIS PRICE
H708-952-0727 W708-576-0901

AD BY: AL FENG ON 901030

ZENITH ZT-1 [300 BAUD TERMINAL]
W/ COMPOSITE MONITOR\$80
INTEGRATED ACCOUNTS (on 3 mdv)
.....\$40
SPEEDSCREEN ROM (w/ RAM code on
1 mdv)\$30
NUCLEON (on 2 mdv)\$15
CALL: Al Feng H(708) 971-0495

AD BY: AL MAHANNA ON 900222

40 MB HARD DRIVE
FOR COMPAQ 386 ZOE COMPUTER
29 uS AVERAGE SEEK TIME
\$350 OR BEST.
CALL AL MAHANNA H708/259-8349
H708/392-2982 or W708/576-4515

AD BY:MIKE CARRINGTON ON 900810
 %%%%%%%%%%%
 ===== Turbo C 2.0 =====
 Original books and disks for
 Turbo C 2.0 from Borland Inter-
 national. Fast compilation and
 easy to use. Includes graphics
 library. \$55. Mike 708/576-2006
 =====

AD BY: JIM PEULECKE ON 900205
 %%%%%%%%%%%
 TANDY MODEL 100 PORTABLE COMES
 WITH BASIC AND THREE
 APPLICATION PROGRAMS BUILT IN.
 EXTRAS INCLUDE 32K OF RAM,
 PROTECTIVE 'SKIN' OVER FRONT,
 SOFT CASE, HARD CASE, AND OF
 COURSE, BUILT-IN MODEM.
 !!! LIKE - NEW CONDITION !!!
 \$350.00 OR BEST OFFER
 CONTACT JIM PEULECKE
 W815-744-1545 or H815-886-4648

FOR SALE: ON 900721
 %%%%%%%%%%%
 LEADING EDGE GREEN SCREEN 13"
 MONITOR HAS LESS THAN 100
 HOURS. PURCHASED 1987 IBM TTL
 DB-9 CONNECTOR.
 CONTACT: BRUCE EASTMOND
 W708/576-2112 H708/969-6603
 C L E A N ! \$40

FOR SALE: ON 901105
 %%%%%%%%%%%
SAMSUNG COLOR RGB.....
 Model CD 1464W \$239
 Diagonal 13 inches
 RGB Color Graphics card \$39
 John Champlin 480-5225 W
 520-1534 h

GREAT PC COMBOS!!!
 JUST IN TIME FOR GIFT GIVING - WE ARE REDUCING OUR ENTIRE STOCK
 OF IBM COMPATIBLES TO ALLOW MORE OF YOU TO GET STARTED IN 1991!
 We have several units for sale and we hope that the prices will
 look attractive to you. JUST TIME TO BUY!!

PACKAGE #1
 CORONA CS-45 SYSTEM INCLUDES:
 04M RAM-1 SERIAL PORT-1 PARALLEL PORT-1 GAME PORT
 84 KEY KEYBOARD-CGA/MONO DISPLAY OUT W/NUMBER MONITOR
 3 SLOTS FOR EXPANSION AND PS-DUS - THIS UNIT IS ALSO
 APPLE COMPATIBLE! GREAT LITTLE COMPUTER. 4.77/8/10 MHz
 REGULAR RETAIL \$1299 OUR SALE PRICE \$550 PLUS \$45 SHIPPING

PACKAGE #2
 LASH PC WITH THE FOLLOWING FEATURES:
 04M RAM-1 SER PORT-1 PAR PORT-1 GAME PORT-1 30MB DRIVE
 CGA VIDEO W/ CGA MONITOR-84 KEY KEYBOARD AND PS-DUS
 REGULAR RETAIL \$1100 OUR PRICE \$550 W/ \$45 PLUS \$45 SHIPPING
 W/D MONITOR - ONLY \$175! PLUS \$45 SHIPPING

PACKAGE #3
 RAYPC PC WITH THE FOLLOWING FEATURES:
 04M RAM-1 PARALLEL PORT-1 30MB DRIVE-101 KEYBOARD W/LE
 AT STYLE CASE W/ MONITOR FOR 2 PURE DRIVERS/2 HARD DRIVES
 5 EMPTY SLOTS-CGA/MONO DISPLAY OUT W/14" CGA MONITOR
 W/VIDEO AND PS-DUS PLUS \$45 SHIPPING
 REGULAR RETAIL \$1499 OUR PRICE \$550 PLUS \$45 SHIPPING
 * W/D MONITOR - ONLY \$475! PLUS \$45 SHIPPING
 FULL FACTORY WARRANTY - 1 YEAR/100,000 CYCLES - 1 YEAR/100,000

PACKAGE #4
 AN RMS SPECIAL! 10MHz 486 SYSTEM. HERE'S ONE YOU CAN'T REMI
 DUAL SPEED 8/12MHz 486 AT MOTHERBOARD-SLOT 100MB RAM
 (EXPANDABLE)-BANK AT SLIDEOUT CASE-200 WATT PS-DUS
 KEYBOARD-MULTI I/O W/ SERIAL/10MB/10MB PORT/IDE HARD
 FLOPPY CONTROLLED/CLOCK/CALENDAR
 SUPER LOW PRICE - ONLY \$550! PLUS \$45 SHIPPING (MONITOR 30MB
 10MHz Bank AT SAME AS ABOVE, BUT FASTER. ONLY \$650 + \$45 SHI
 MONITOR

RMS1050 SCOTT 14" CGA/RGB REG. \$499.95 NOW: \$130 + \$45 SHI
 RMS1050 AMDEI 14" CGA/RGB REG. \$499.95 NOW: \$130 + \$45 SHI
 PRINTERS * CABLES * DISK DRIVES * HARD DRIVES * EXPANSION BUNDLES
 SWITCH BOXES * UPGRADE MOTHERBOARDS * MUCH MORE AVAILABLE

FOR SALE: ON 900819
 %%%%%%%%%%%
 Color Computer 1 with 64K
 Extended BASIC, DEC dual disk
 drives in a single housing, J&M
 controller with RS 1.0, 1.1,
 and ADOS. Also joysticks, home
 appliance controller, LOTS of
 Software and documentation.
 Other extras. \$130 Ray Dubiel
 w708-576-5862 or h708-991-1987

FOR SALE: ON 900819
 %%%%%%%%%%%
 IBM PCXT compatible computer.
 Wugo, made in Taiwan.
 Completely 100% IBM compatible.
 640K RAM, 8 Slot Motherboard,
 large keyboard, 2 Half Height
 floppy drives, one half height
 20 Meg hard drive,
 Multi-function card w/serial
 port and clock. Game card and
 joystick. Mouse systems mouse,
 1200 baud modem, RGB Color
 Monitor, Epsom MX80 w/Graftrax
 serial and parallel printer
 (has Hanzon card for Macintosh
 compatibility too). Tons of
 applications, documentation and
 games. Other extras. Whole
 thing \$950. Ray Dubiel
 w708-576-5862 or h708-991-1987

USED TIMEX/SINCLAIR HARDWARE ITEMS

 HERE ARE A FEW SLIGHTLY USED ITEMS WE HAVE FOR SALE
 ALL IN A1 CONDITION! ALL SOLD ON FIRST COME-FIRST SERVED BASIS
 PLEASE CALL BEFORE YOU ORDER TO CHECK AVAILABILITY!!

QTY:	DESCRIPTION	RETAIL	USED PR	SHIPPING
2	*TS2068 COMPUTER ONLY-REFURBES NO POWER SUPPLY/BOOK/CABLES REFURBED! GREAT FOR BACKUP!	\$149.00 EA	75.00 EA	5.00 EA
1	TS2040 PRINTER - COMPLETE	39.95	25.00	5.00
1	*TS2068 COMPLETE	199.95	100.00	5.00
1	MEMOTECH SPREADSHEET ANALY. CART	79.95	45.00	3.00
3	BYTE-BACK 2068 MODEMS (NEW)	140.00	40.00	4.00
2	A&J WAFER TRAY	9.95	3.00	1.50
1	TS1000 W/OVERLAY RUBBER KEYBOARD (COMPUTER IS NOT WORKING)	77.77	15.00	4.00
10	*TS1000 (BAD KEYBOARDS?) (UNIT ONLY-NO CABLES/PS)		10.00 EA	2.00 EA
2	*AXIOM IMP4 D/H PRINTER	299.95	55.00	15.00
1	*BLUE CHIP M120/10 PRINTERS (SAME AS LEGEND 800/SQUARE DOT)	239.95	110.00 EA	12.50 EA
3	*100 WATT DD POWER SUPPLIES CAN HANDLE UP TO 4 DISK DRIVES	129.95EA	25.00 EA	6.00 EA
10	9 VOLT P/S-ALL WORK-PLUS TOO LARGE FOR 1000.	7.95EA	2.00 EA	2.00 EA
1	PANASONIC RECORDER (DEMOS)UP TO (WITH AC ADAPTOR AND MANUAL)	59.95	15.00 EA	4.00 EA
12	*A&J WAFERS-SEVERAL SIZES (\$23/10 PLUS \$4 SHIPPING)	4.50 EA	2.50 EA	.50 EA

SPECIAL! - HURRY!!!!

ON ANY \$50 ORDER FROM THIS PAGE, YOU MAY DEDUCT AN EXTRA
 \$5.00
 FROM THE TOTAL ORDER! (DO NOT COUNT SHIPPING)

NOTE ON SOME ITEMS THE PER ITEM SHIPPING WILL BE REDUCED
 GREATLY WHEN ORDERING WITH OTHER ITEMS. PLEASE CHECK.

(* DENOTES NEW ITEMS OR CHANGED ITEMS)

(NOTE: IF ORDERING MORE THAN 1 ITEM, MAXIMUM SHIPPING WILL BE
 NO MORE THAN \$40) FOR THE ENTIRE ORDER.

MAKE CHECKS OR MONEY ORDERS OUT TO:
 RMG ENTERPRISES
 1419 1/2 7TH STREET * OREGON CITY, OR 97045
 503/655-7484 * NOON TILL 10 PM TUE-SAT
 PRICES GOOD THRU 12/15/90

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PRICES EFFECTIVE FEBRUARY 15, 1989

THE SINCLAIR QL

THE BEST 68000 BASED COMPUTER ON THE MARKET FOR THE PRICE!!!!

ALL OF THE FEATURES LISTED BELOW, AND AT A PRICE OF

ONLY \$149.95!

FEATURES:

128K RAM-EXPANDABLE TO OVER 3 MEGS!
32K ROM-EXPANDABLE TO 64K
2 BUILT IN MICRODRIVES-100K STORAGE EACH
2 RS232 PORTS * 2 JOYSTICK PORTS
2 NETWORKING PORTS * RGB PORT
TV PORT * FULL SIZED KEYBOARD
FUNCTION KEYS * CURSOR CONTROLS
68000 32 BIT PROCESSOR * COMPACT- APPROX. 5x2x18 INCHES
WEIGHS ONLY 3 POUNDS! * MULTITASKING
WINDOWS * UP TO 512x256 PIXEL RESOLUTION
UP TO 8 COLORS * 4 INTERACTIVE SW PACKS
MANUAL * MUCH, MUCH MORE!!

(FOR FULL SPECS OR BROCHURE, SEND 8x11" S.A.S.E. \$0.30)

ORDER RMG#274 PLEASE ADD \$6.00 SHIPPING FOR EACH UNIT.

QL ACCESSORIES

ORDER #	ITEM	PRICE
RMG#275	RS232C PRINTER CABLE-----	\$ 14.95
RMG#276	RGB MONITOR CABLE-----	\$ 14.95
SOFTWARE---		
** RMG#280	QL ASSEMBLER PROGRAM-----	34.95
** RMG#281	QL MONITOR PROGRAM-----	24.95
** RMG#284	QL TOUCH 'N' GO-----	24.95
** RMG#285	QL HOME FINANCE PACKAGE-----	24.95
** RMG#286	QL CAVERN-----	14.95
** RMG#287	QL GARDENER-----	24.95
** RMG#288	QL DECISION MAKER-----	34.95
** RMG#291	QL TECHNICAL GUIDE-----	27.95
RMG#379	QL BLANK HDV CARTRIDGE-----	\$ 8.00/EA
RMG#186	BONUS PAK-12 BLANK HDV CARTS W/THOMPSON CASE (A \$38.00 VALUE)-----	\$ 99.00

*** MORE ON PAGE QL-2 ***

(**NOTE-THese TITLES ARE OUT OF PRODUCTION AND MAY NOT BE
AVAILABLE-CHECK BEFORE YOU ORDER!)

HERE ARE MORE FINE PRODUCTS FOR YOUR QL!

RMG#335	RGB TO COMPOSITE MONITOR CABLE-----	\$ 10.95
USE IN RGB PORT FOR COMPOSITE MONITOR (MONO ONLY)		
RMG#344	SERIAL TO CENTRONICS PRINTER I/F-----	54.95
ALLOWS YOU TO USE YOUR PARALLEL PRINTER		
* RMG#465	QFLASH ROM CARTRIDGE-----	37.50
THIS ONE LETS YOU RESERVE UP TO 8 RAM DISKS FOR YOUR USE AS SOON AS YOU TURN ON THE QL. COMES WITH BUILT IN TOOLKIT FUNCTIONS		
* RMG#419	POINT BLANK-KARATE (GAME)-----	24.95
QUICK ACTION WILL SAVE YOU HERE! WATCH OUT FOR THAT KICK! PUNCH AND DUCK TO SURVIVE!		
* RMG#480	MIRACLE-SCREEN DUMP PROGRAM-----	15.95
NEED A COPY OF YOUR SCREEN? THIS SOFTWARE WILL HELP YOU DO IT!		
* RMG#763	ARROW-QL SOUNDESIGN-----	15.95
THIS FINE UTILITY/LEARNING PACKAGE WILL NEW!! SHOW YOU THE WAY TO MAKE BETTER SOUNDS WITH YOUR QL! EASY TO USE! SAVE SOUNDS TO TAPE OR PRINTER!		
* RMG#467	CONCEPT 3-D GRAPHICS DESIGN-----	34.95
THIS ONE ALLOWS YOU TO DESIGN YOUR OWN DRAWINGS IN 3-D!		
* RMG#757	BOOK-ASSEMBLY LAN. PROGRAMMING ON THE QL---	14.05
A MUST FOR THE ADVANCED QL PROGRAMMER!		
* RMG#704	RIDERBOX-LIBRARY BOX FOR CARTS-----	7.00
BOOKSHELF BOX HOLDS 4 HDV CARTS & INDEX		
RMG#688	QL POWER SUPPLY-----	45.00
REPLACEMENT POWER SUPPLY FOR THE QL. <u>ADD \$4.50 SH</u>		
RMG#679	QL BACKUP COMPUTER ONLY-----	40.05
JUST THE KEYBOARD & INSIDES-NO P/S, S/W OR MANUAL. JUST IN CASE! <u>ADD \$5.00 SHIPPING</u>		
RMG#386	THOMPSON CASE-----	2.00
NEAT LITTLE STORAGE BOX**STORES 12 CARTRIDGES		
* RMG#634	BOOK-TAKING THE QUANTUM LEAP-----	28.00
GREAT BOOK BY MIKE DE SOSA! OVERVIEW OF THE QL WITH TIPS & HINTS! <u>ADD \$3.00 SHIPPING</u> (* = MAY NOT BE AVAILABLE! - CHECK FIRST!!)		

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2068 DISK SYSTEMS

MOVING UP TO DISK STORAGE?

THE AERCO FD-68 SYSTEM
MAY BE JUST WHAT YOU ARE LOOKING FOR!

WE HAVE SEVERAL SYSTEMS TO CHOOSE FROM:

I/F ONLY-----\$189.95+PH
I/F WITH 2 TANDON SSDD F/H DRIVES, CASE W/PS-CABLES---\$325.00+PH
(5.25" DRIVES-ALL NEW DRIVES & CAGES)
I/F WITH 1 TANDON SSDD F/H DRIVE, CASE W/PS-CABLE-----\$269.95+PH
I/F WITH 2 3" AMDEK SYSTEM-CABLES, CASE W/PS-----\$265.00+PH
(PLEASE ADD \$3.00 SHIPPING FOR EACH OF THE ABOVE)

THE FD-68 IS ONE OF THE MOST WIDELY USED DISK SYSTEM IN THE U.S.
MUCH EXISTING SOFTWARE HAS BEEN CONVERTED TO RUN ON THIS SYSTEM.
MUCH MORE IS BEING WRITTEN TO RUN ON IT.
(* ALL AERCO PRODUCTS SUBJECT TO AVAILABILITY *)

LARKEN DISK SYSTEM

HERE IT IS!! THE LONG-AWAITED 400K LARKEN DISK SYSTEM!!

THESE FEATURES MAKE IT A REAL BUY IN TODAY'S MARKET!

- 1> USES ALL STANDARD 2068 CASSETTE COMMANDS.
- 2> 2 BOARD DESIGN MAKES IT A SMALLER SYSTEM.
- 3> DOS IS ON EPROM IN THE CARTRIDGE PORT.
- 4> USES NO MEMORY!
- 5> HAS 10 BUILT IN EXTENDED BASIC COMMANDS.
- *6> CAN IMPLEMENT 256K RAMDISK!
- 7> WILL RUN UP TO 4 DRIVES, ANY SIZE, SD-DD-QD!
- 8> SPECTRUM COMPATIBLE!
- 9> CAN BE USED WITH OS-64 OR OTHER CARTRIDGE PROGRAMS!
- 10> AND BEST OF ALL? LOWEST PRICED!

RMG#615 DOS CARTRIDGE AND CONTROLLER BOARDS===== \$124.95
RMG#617 DOS CARTRIDGE FOR AERCO I/F===== \$ 65.00
RMG#618 RAMEX & RMG#619 OLIGER===== \$ 65.00
(PLEASE ADD \$4.50 SHIPPING FOR SYSTEM-\$3.00 FOR CART ONLY.)

WE ALSO CARRY A COMPLETE LINE OF DISK DRIVE CASES.
WE HAVE CABLES AND CABLE ENDS * WE CARRY OTHER DISK DRIVES,
CABLES AND SUPPLIES. (SEE GHW PAGES)

LARKEN DISK SYSTEMS

HERE ARE SOME COMPLETE DISK SYSTEMS WE HAVE AVAILABLE!

RMG#P106 LARKEN SYSTEM WITH AMDEK 3" DRIVES-----\$189.95+\$6+PH
THIS SYSTEM CONSISTS OF THE DUAL AMDEK III DRIVES
WITH THE LARKEN DOS CARTRIDGE AND CONTROLLER,
COMPLETE WITH CABLES AND BOOT DISK. READY TO
PLUG IN AND RUN!

RMG#P101 LARKEN SYSTEM W/1 DSQD (80TR) DRIVE-----\$299.95+\$6PH
THIS SYSTEM CONSISTS OF THE LARKEN 2 BOARD
SYSTEM WITH 1 DSQD 80 TRACK 1/2 HEIGHT 5.25"
DRIVE, CASE, POWER SUPPLY, CABLES AND BOOT
DISK. ALL NEW COMPONENTS.

RMG#P102 LARKEN SYSTEM WITH 1 MITSUBISHI 3.5" DRIVE--\$249.95+\$5PH
INCLUDES 1 3.5" 400K DRIVE WITH CASE,
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BOOT DISK.

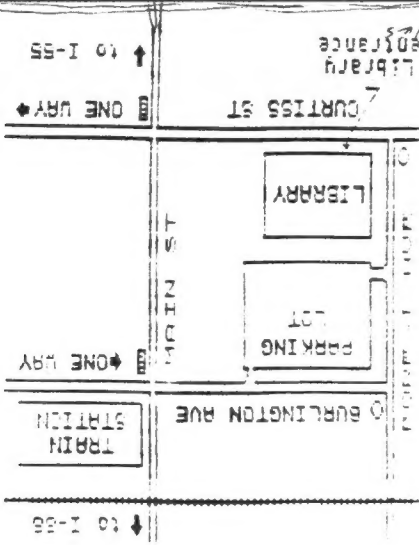
RMG#P107 LARKEN SYSTEM WITH 2 MITSUBISHI 3.5" DRVS--\$295.00+\$6PH
WITH THIS ONE YOU GET 2 MITSUBISHI 3.5"
400K DRIVES, CASE, POWER SUPPLY, LARKEN
2 BOARD SYSTEM AND BOOT DISK.

RMG#P108 LARKEN SYSTEM WITH 1 TEAC 3.5" DRIVE-----\$329.95+\$5PH
THIS ONE GIVES YOU 1 TEAC 3.5" 800K DRIVE
IN 5.25" CASE WITH POWER SUPPLY,
LARKEN 2 BOARDS, CABLES AND BOOT DISK.

RMG#P109 LARKEN SYSTEM WITH 2 TEAC 3.5" DRIVES-----\$419.95+\$6PH
THIS IS OUR "TOP OF THE LINE" SYSTEM!
LARKEN 2 BOARD SYSTEM WITH 2 TEAC 3.5"
800K DRIVES IN 5.25" CASE WITH POWER SUPPLY,
CABLES AND BOOT DISK. THAT IS 1.6 MEGA
BYTES OF STORAGE IN A CASE THAT IS 4x6x12
INCHES IN SIZE! COMBINE THAT WITH THE
LARKEN RAMDISK SYSTEM AND WHAT A SYSTEM!

RMG#764 LARKEN 2068 256K RAM DISK BOARD-----\$ 35.95+\$3PH
NOW YOU CAN HAVE UP TO 256K OF NON-VOLATILE
RAM IN WHICH TO STORE PROGRAMS AND DATA. CAN
BE USED WITH CASSETTE, MICRODRIVE OR DISK.
THIS STAND-ALONE SYSTEM OPERATES WITH THE
LARKEN DOS CARTRIDGE. THIS PRICE INCLUDES
THE PRINTED CIRCUIT BOARD WITH EDGE CONNECTORS,
MINI-SWITCH, AND COMPLETE PARTS LIST WITH
DETAILED ASSEMBLY INSTRUCTIONS. RAM CHIPS ARE
ALSO AVAILABLE.

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